FIG. 1A

```
   1 CCTAGAGCCAGCAGAGTCCAGGCTGCTGTTAACAACTTCATGTCCCCGTGGGTAGCAGGC   60
  61 AGGTGCTTCTGTCTGATCTGGCTCTCCTTGACCACTGTACTCATCAAATAGACCAAGATC  120
 121 CCCAGAGTCCAAGATCCTTACAAGGGGGCCAGAAAGGGATGAGCTTTCTGAAGAAGCACT  180
 181 GATGTAAAATACCAGGAATTTTGACATCGAAGAAGATTTTTGTGATGGCAGCTGGGATTT  240
 241 GGCCATAATCTAGAAGACACATGGTGAATACAGTTGCAAGTCATTTAGTCATATTTCTTG  300
 301 CTAAATTGCTGTGTCTTCAATGGCTGAATTGAAGATCCCTCTTACCCGCCAGGTGCCAAG  360
 361 AACTATGAACAGGCAGGGCAATAGAAAGACAACTAAAGAAGGATCCAACGATTTGAAATT  420
 421 CCAGAACTTCAGTCTGCCAAAAAACAGGTCATGGCCTCGCATCAATAGTGCCACAGGCCA  480
 481 GTACCAGAGGATGAACAAGCCTCTTCTAGACTGGGAAAGAAACTTTGCTGCAGTCCTGGA  540
 541 TGGAGCAAAAGGCCACAGTGATGATGACTATGATGACCCTGAGCTTCGGATGGAAGAGAC  600
 601 ATGGCAGTCGATTAAAATTTTACCAGCCCGGCCTATAAAGGAATCTGAATATGCAGATAC  660
 661 ACACTATTTCAAGGTTGCAATGGACACTCCCCTTCCGTTAGACACCAGGACCTCTATCTC  720
 721 CATTGGACAGCCGACCTGGAACACACAGACGAGGTTGGAAAGAGTGGACAAACCCATTTC  780
 781 CAAGGACGTCAGAAGCCAAAACATTAAAGGAGATGCATCCGTAAGAAAGAACAAGATTCC  840
 841 TTTACCACCTCCTCGGCCTCTCATAACACTTCCGAAGAAGTACCAACCCTTGCCCCCTGA  900
 901 GCCGGAGAGCAGCAGGCCACCTTTATCTCAGAGACACACCTTTCCAGAAGTCCAGAGAAT  960
 961 GCCCAGTCAGATAAGCTTAAGGGACTTAAGTGAGGTCCTTGAAGCAGAAAAAGTTCCTCA 1020
1021 TAACCAGAGGAAGCCTGAATCAACTCATCTGTTAGAAAACCAAAATACTCAAGAGATTCC 1080
1081 ACTTGCCATTAGCAGTTCTTCATTCACGACAAGCAACCACAGTGTGCAAAACAGAGATCA 1140
1141 TAGAGGAGGCATGCAGCCCTGTTCTCCTCAGAGATGCCAGCCTCCAGCCAGCTGCAGCCC 1200
1201 TCACGAAAATATACTGCCCTATAAATACACAAGCTGGAGACCACCTTTCCCCAAAAGGTC 1260
1261 TGATAGAAAGGATGTCCAGCACAATGAATGGTACATTGGAGAATACAGCCGCCAGGCAGT 1320
1321 GGAAGAGGCATTCATGAAGGAGAACAAGGATGGTAGTTTCTTGGTCCGAGATTGTTCCAC 1380
1381 AAAATCCAAGGAAGAGCCCTATGTTTTGGCTGTGTTTTATGAGAACAAAGTCTACAATGT 1440
1441 AAAAATCCGCTTCCTGGAGAGGAATCAGCAGTTTGCCCTGGGGACAGGACTCAGAGGAGA 1500
```

FIG. 1B

```
1501 TGAGAAGTTTGATTCAGTAGAAGACATCATCGAACACTACAAGAATTTTCCCATTATACT 1560
1561 AATTGATGGGAAAGATAAAACTGGGGTCCACAGGAAACAGTGTCACCTCACTCAGCCACT 1620
1621 CCCTCTCACCAGACACCTCTTGCCTCTGTAGCCTGGTCTTTGTGTTATCTTTGGTTTACT 1680
1681 GGATTCAGCGCTTCCATTGTTTTCATTGATTTCAAAAGTTTATTTTCTGTGCCTTCAAGG 1740
1741 GACAACTTTTTTAACTTTGGAGAAAAGAAAAACACTCTATAACAGAGAGTGGAAAATCAC 1800
1801 TCACGGTTTTGAAAGTTCAAACCACAGAGAAAATATTTATAACATGCAAAA          1851
```

TIGGGG

FIG. 2

1							M	A	E	L	K	I	P	L	T	R	Q	V	P	R	14
15	T	M	N	R	Q	G	N	R	K	T	T	K	E	G	S	N	D	L	K	F	34
35	Q	N	F	S	L	P	K	N	R	S	W	P	R	I	N	S	A	T	G	Q	54
55	Y	Q	R	M	N	K	P	L	L	D	W	E	R	N	F	A	A	V	L	D	74
75	G	A	K	G	H	S	D	D	D	Y	D	D	P	E	L	R	M	E	E	T	94
95	W	Q	S	I	K	I	L	P	A	R	P	I	K	E	S	E	Y	A	D	T	114
115	H	Y	F	K	V	A	M	D	T	P	L	P	L	D	T	R	T	S	I	S	134
135	I	G	Q	P	T	W	N	T	Q	T	R	L	E	R	V	D	K	P	I	S	154
155	K	D	V	R	S	Q	N	I	K	G	D	A	S	V	R	K	N	K	I	P	174
175	L	P	P	P	R	P	L	I	T	L	P	K	K	Y	Q	P	L	P	P	E	194
195	P	E	S	S	R	P	P	L	S	Q	R	H	T	F	P	E	V	Q	R	M	214
215	P	S	Q	I	S	L	R	D	L	S	E	V	L	E	A	E	K	V	P	H	234
235	N	Q	R	K	P	E	S	T	H	L	L	E	N	Q	N	T	Q	E	I	P	254
255	L	A	I	S	S	S	S	F	T	T	S	N	H	S	V	Q	N	R	D	H	274
275	R	G	G	M	Q	P	C	S	P	Q	R	C	Q	P	P	A	S	C	S	P	294
295	H	E	N	I	L	P	Y	K	Y	T	S	W	R	P	P	F	P	K	R	S	314
315	D	R	K	D	V	Q	H	N	E	W	Y	I	G	E	Y	S	R	Q	A	V	334
335	E	E	A	F	M	K	E	N	K	D	G	S	F	L	V	R	D	C	S	T	354
355	K	S	K	E	E	P	Y	V	L	A	V	F	Y	E	N	K	V	Y	N	V	374
375	K	I	R	F	L	E	R	N	Q	Q	F	A	L	G	T	G	L	R	G	D	394
395	E	K	F	D	S	V	E	D	I	I	E	H	Y	K	N	F	P	I	I	L	414
415	I	D	G	K	D	K	T	G	V	H	R	K	Q	C	H	L	T	Q	P	L	434
435	P	L	T	R	H	L	L	P	L												443

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FIG. 3A

```
   1  CCTAGAGCCAGCAGAGTCCAGGCTGCTGTTAACAACTTCATGTCCCCGTGGGTAGCAGGC   60

  61  AGGTGCTTCTGTCTGATCTGGCTCTCCTTGACCACTGTACTCATCAAATAGACCAAGATC   120

 121  CCCAGAGTCCAAGATCCTTACAAGGGGGCCAGAAAGGGATGAGCTTTCTGAAGAAGCACT   180

 181  GATGTAAAATACCAGGAATTTTGACATCGAAGAAGATTTTTGTGATGGCAGCTGGGATTT   240

 241  GGCCATAATCTAGAAGACACATGGTGAATACAGTTGCAAGTCATTTAGTCATATTTCTTG   300

 301  CTAAATTGCTGTGTCTTCAATGGCTGAATTGAAGATCCCTCTTACCCGCCAGGTGCCAAG   360
   1                    M  A  E  L  K  I  P  L  T  R  Q  V  P  R    14

 361  AACTATGAACAGGCAGGGCAATAGAAAGACAACTAAAGAAGGATCCAACGATTTGAAATT   420
  15   T  M  N  R  Q  G  N  R  K  T  T  K  E  G  S  N  D  L  K  F    34

 421  CCAGAACTTCAGTCTGCCAAAAAACAGGTCATGGCCTCGCATCAATAGTGCCACAGGCCA   480
  35   Q  N  F  S  L  P  K  N  R  S  W  P  R  I  N  S  A  T  G  Q    54

 481  GTACCAGAGGATGAACAAGCCTCTTCTAGACTGGGAAAGAAACTTTGCTGCAGTCCTGGA   540
  55   Y  Q  R  M  N  K  P  L  L  D  W  E  R  N  F  A  A  V  L  D    74

 541  TGGAGCAAAAGGCCACAGTGATGATGACTATGATGACCCTGAGCTTCGGATGGAAGAGAC   600
  75   G  A  K  G  H  S  D  D  D  Y  D  D  P  E  L  R  M  E  E  T    94

 601  ATGGCAGTCGATTAAAATTTTACCAGCCCGGCCTATAAAGGAATCTGAATATGCAGATAC   660
  95   W  Q  S  I  K  I  L  P  A  R  P  I  K  E  S  E  Y  A  D  T   114

 661  ACACTATTTCAAGGTTGCAATGGACACTCCCCTTCCGTTAGACACCAGGACCTCTATCTC   720
 115   H  Y  F  K  V  A  M  D  T  P  L  P  L  D  T  R  T  S  I  S   134

 721  CATTGGACAGCCGACCTGGAACACACAGACGAGGTTGGAAAGAGTGGACAAACCCATTTC   780
 135   I  G  Q  P  T  W  N  T  Q  T  R  L  E  R  V  D  K  P  I  S   154

 781  CAAGGACGTCAGAAGCCAAAACATTAAAGGAGATGCATCCGTAAGAAAGAACAAGATTCC   840
 155   K  D  V  R  S  Q  N  I  K  G  D  A  S  V  R  K  N  K  I  P   174

 841  TTTACCACCTCCTCGGCCTCTCATAACACTTCCGAAGAAGTACCAACCCTTGCCCCCTGA   900
 175   L  P  P  P  P  R  P  L  I  T  L  P  K  K  Y  Q  P  L  P  P  E   194

 901  GCCGGAGAGCAGCAGGCCACCTTTATCTCAGAGACACACCTTTCCAGAAGTCCAGAGAAT   960
 195   P  E  S  S  R  P  P  L  S  Q  R  H  T  F  P  E  V  Q  R  M   214

 961  GCCCAGTCAGATAAGCTTAAGGGACTTAAGTGAGGTCCTTGAAGCAGAAAAAGTTCCTCA  1020
 215   P  S  Q  I  S  L  R  D  L  S  E  V  L  E  A  E  K  V  P  H   234

1021  TAACCAGAGGAAGCCTGAATCAACTCATCTGTTAGAAAACCAAAATACTCAAGAGATTCC  1080
 235   N  Q  R  K  P  E  S  T  H  L  L  E  N  Q  N  T  Q  E  I  P   254

1081  ACTTGCCATTAGCAGTTCTTCATTCACGACAAGCAACCACAGTGTGCAAAACAGAGATCA  1140
 255   L  A  I  S  S  S  S  F  T  T  S  N  H  S  V  Q  N  R  D  H   274

1141  TAGAGGAGGCATGCAGCCCTGTTCTCCTCAGAGATGCCAGCCTCCAGCCAGCTGCAGCCC  1200
```

FIG. 3B

```
275   R  G  G  M  Q  P  C  S  P  Q  R  C  Q  P  P  A  S  C  S  P    294

1201  TCACGAAAATATACTGCCCTATAAATACACAAGCTGGAGACCACCTTTCCCCAAAAGGTC  1260
295   H  E  N  I  L  P  Y  K  Y  T  S  W  R  P  P  F  P  K  R  S    314

1261  TGATAGAAAGGATGTCCAGCACAATGAATGGTACATTGGAGAATACAGCCGCCAGGCAGT  1320
315   D  R  K  D  V  Q  H  N  E  W  Y  I  G  E  Y  S  R  Q  A  V    334

1321  GGAAGAGGCATTCATGAAGGAGAACAAGGATGGTAGTTTCTTGGTCCGAGATTGTTCCAC  1380
335   E  E  A  F  M  K  E  N  K  D  G  S  F  L  V  R  D  C  S  T    354

1381  AAAATCCAAGGAAGAGCCCTATGTTTTGGCTGTGTTTTATGAGAACAAAGTCTACAATGT  1440
355   K  S  K  E  E  P  Y  V  L  A  V  F  Y  E  N  K  V  Y  N  V    374

1441  AAAAATCCGCTTCCTGGAGAGGAATCAGCAGTTTGCCCTGGGGACAGGACTCAGAGGAGA  1500
375   K  I  R  F  L  E  R  N  Q  Q  F  A  L  G  T  G  L  R  G  D    394

1501  TGAGAAGTTTGATTCAGTAGAAGACATCATCGAACACTACAAGAATTTTCCCATTATACT  1560
395   E  K  F  D  S  V  E  D  I  I  E  H  Y  K  N  F  P  I  I  L    414

1561  AATTGATGGGAAAGATAAAACTGGGGTCCACAGGAAACAGTGTCACCTCACTCAGCCACT  1620
415   I  D  G  K  D  K  T  G  V  H  R  K  Q  C  H  L  T  Q  P  L    434

1621  CCCTCTCACCAGACACCTCTTGCCTCTGTAGCCTGGTCTTTGTGTTATCTTTGGTTTACT  1680
435   P  L  T  R  H  L  L  P  L  *                                  444

1681  GGATTCAGCGCTTCCATTGTTTTCATTGATTTCAAAAGTTTATTTTCTGTGCCTTCAAGG  1740

1741  GACAACTTTTTTAACTTTGGAGAAAAGAAAAACACTCTATAACAGAGAGTGGAAAATCAC  1800

1801  TCACGGTTTTGAAAGTTCAAACCACAGAGAAAATATTTATAACATGCAAAA            1851
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Patent Application Publication

FIG. 4A

```
   1 GTCAGACCTCTCAGGTCTGTGGCTGCATTTCACAGGAAACCAAGTCTAAAACGGACCTAT   60
  61 CAGGAGGTTTTCTGCTGAAGGGCACTGCTTAGCATCGAGAAGAATTCAACCCACCGCCTT  120
 121 ACTAATTTCCAGTGCCCCAAGGTCTCTGCACTGCCGCCCCTCCTCACAGGAGACGGACAC  180
 181 CTCAGCCTAGATCCCTTGGTGCTCTCCACGCTGTTCAGGCTGAATTGAAGATCCCTCTTA  240
 241 CCCGCCAGGTGCCAAGAACTATGAACAGGCAGGGCAATAGAAAGACAACTAAAGAAGGAT  300
 301 CCAACGATTTGAAATTCCAGAACTTCAGTCTGCCAAAAAACAGGTCATGGCCTCGCATCA  360
 361 ATAGTGCCACAGGCCAGTACCAGAGGATGAACAAGCCTCTTCTAGACTGGGAAAGAAACT  420
 421 TTGCTGCAGTCCTGGATGGAGCAAAAGGCCACAGTGATGATGACTATGATGACCCTGAGC  480
 481 TTCGGATGGAAGAGACATGGCAGTCGATTAAAATTTTACCAGCCCGGCCTATAAAGGAAT  540
 541 CTGAATATGCAGATACACACTATTTCAAGGTTGCAATGGACACTCCCCTTCCGTTAGACA  600
 601 CCAGGACCTCTATCTCCATTGGACAGCCGACCTGGAACACACAGACGAGGTTGGAAAGAG  660
 661 TGGACAAACCCATTTCCAAGGACGTCAGAAGCCAAAACATTAAAGGAGATGCATCCGTAA  720
 721 GAAAGAACAAGATTCCTTTACCACCTCCTCGGCCTCTCATAACACTTCCGAAGAAGTACC  780
 781 AACCCTTGCCCCCTGAGCCGGAGAGCAGCAGGCCACCTTTATCTCAGAGACACACCTTTC  840
 841 CAGAAGTCCAGAGAATGCCCAGTCAGATAAGCTTAAGGGACTTAAGTGAGGTCCTTGAAG  900
 901 CAGAAAAAGTTCCTCATAACCAGAGGAAGCCTGAATCAACTCATCTGTTAGAAAACCAAA  960
 961 ATACTCAAGAGATTCCACTTGCCATTAGCAGTTCTTCATTCACGACAAGCAACCACAGTG 1020
1021 TGCAAAACAGAGATCATAGAGGAGGCATGCAGCCCTGTTCTCCTCAGAGATGCCAGCCTC 1080
1081 CAGCCAGCTGCAGCCCTCACGAAAATATACTGCCCTATAAATACACAAGCTGGAGACCAC 1140
1141 CTTTCCCCAAAAGGTCTGATAGAAAGGATGTCCAGCACAATGAATGGTACATTGGAGAAT 1200
1201 ACAGCCGCCAGGCAGTGGAAGAGGCATTCATGAAGGAGAACAAGGATGGTAGTTTCTTGG 1260
1261 TCCGAGATTGTTCCACAAAATCCAAGGAAGAGCCCTATGTTTTGGCTGTGTTTTATGAGA 1320
1321 ACAAAGTCTACAATGTAAAAATCCGCTTCCTGGAGAGGAATCAGCAGTTTGCCCTGGGGA 1380
1381 CAGGACTCAGAGGAGATGAGAAGTTTGATTCAGTAGAAGACATCATCGAACACTACAAGA 1440
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FIG. 4B

```
1441  ATTTTCCCATTATACTAATTGATGGGAAAGATAAAACTGGGGTCCACAGGAAACAGTGTC 1500
1501  ACCTCACTCAGCCACTCCCTCTCACCAGACACCTCTTGCCTCTGTAGCCTGGTCTTTGTG 1560
1561  TTATCTTTGGTTTACTGGATTCAGCGCTTCCATTGTTTTCATTGATTTCAAAAGTTTATT 1620
1621  TTCTGTGCCTTCAAGGGACAACTTTTTTAACTTTGGAGAAAAGAAAAACACTCTATAACA 1680
1681  GAGAGTGGAAAATCACTCACGGTTTTGAAAGTTCAAACCACAGAGAAAATATTTATAACA 1740
1741  TGCAAAAAATAAAAACATTCTAGTAACTGGCCACTGGAAAATAAATAAAAATAAAAACTA 1800
1801  GGGTTTTAAAAGTATCTTCTAAAAAACAACAACAAAAAATACTATAAACATAGCCATTAT 1860
1861  GCTCATGATACAGGCGAGCAGCAAAGGGCACCAGAAGCTGTTGCTTAAATGTTTGCAGTC 1920
1921  AGTGCAAGACAAGTCTATGGGAAATTCCCAAATCTGTGCTCTTTACAGGACACTGCGCTG 1980
1981  CCTTTATGTCAGTTGTTGGGCCTTACATATATACAATGTGTGGATGATTTCTTACACTAA 2040
2041  AGATGCTGGGCTGGGTGCGGTGCCTCATGCCTGTAATCCCAGCACTTTGGGAGGCTGAGG 2100
2101  TGGACAGATCACGAGGTCAGGAGATCAAGACCATCCTGGCTAACATGGTGAAACCCCATG 2160
2161  TCTACTAAAAATACAAAAAATCAGCTGGGCGTGGTGGTGGGTGCCTGTAGTCCCAGCTAC 2220
2221  TCGGGAGGCTGAGGCAGGAGAATGGTGTGAACCCGGGAGGCGGAGCTTGCAGTGAGCCGA 2280
2281  AATCGCGCCACTGCACTCCAATCCAGCCTGGGGACAGAGAGACTCCGTCTCAAAA       2335
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FIG. 5

1							M	N	R	Q	G	N	R	K	T	T	K	E	G	S	14
15	N	D	L	K	F	Q	N	F	S	L	P	K	N	R	S	W	P	R	I	N	34
35	S	A	T	G	Q	Y	Q	R	M	N	K	P	L	L	D	W	E	R	N	F	54
55	A	A	V	L	D	G	A	K	G	H	S	D	D	D	Y	D	D	P	E	L	74
75	R	M	E	E	T	W	Q	S	I	K	I	L	P	A	R	P	I	K	E	S	94
95	E	Y	A	D	T	H	Y	F	K	V	A	M	D	T	P	L	P	L	D	T	114
115	R	T	S	I	S	I	G	Q	P	T	W	N	T	Q	T	R	L	E	R	V	134
135	D	K	P	I	S	K	D	V	R	S	Q	N	I	K	G	D	A	S	V	R	154
155	K	N	K	I	P	L	P	P	P	R	P	L	I	T	L	P	K	K	Y	Q	174
175	P	L	P	P	E	P	E	S	S	R	P	P	L	S	Q	R	H	T	F	P	194
195	E	V	Q	R	M	P	S	Q	I	S	L	R	D	L	S	E	V	L	E	A	214
215	E	K	V	P	H	N	Q	R	K	P	E	S	T	H	L	L	E	N	Q	N	234
235	T	Q	E	I	P	L	A	I	S	S	S	S	F	T	T	S	N	H	S	V	254
255	Q	N	R	D	H	R	G	G	M	Q	P	C	S	P	Q	R	C	Q	P	P	274
275	A	S	C	S	P	H	E	N	I	L	P	Y	K	Y	T	S	W	R	P	P	294
295	F	P	K	R	S	D	R	K	D	V	Q	H	N	E	W	Y	I	G	E	Y	314
315	S	R	Q	A	V	E	E	A	F	M	K	E	N	K	D	G	S	F	L	V	334
335	R	D	C	S	T	K	S	K	E	E	P	Y	V	L	A	V	F	Y	E	N	354
355	K	V	Y	N	V	K	I	R	F	L	E	R	N	Q	Q	F	A	L	G	T	374
375	G	L	R	G	D	E	K	F	D	S	V	E	D	I	I	E	H	Y	K	N	394
395	F	P	I	I	L	I	D	G	K	D	K	T	G	V	H	R	K	Q	C	H	414
415	L	T	Q	P	L	P	L	T	R	H	L	L	P	L							428

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FIG. 6A

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```
1    GTCAGACCTCTCAGGTCTGTGGCTGCATTTCACAGGAAACCAAGTCTAAAACCGACCTAT    60

61   CAGGAGGTTTTCTGCTGAAGGGCACTGCTTAGCATCGAGAAGAATTCAACCCACCGCCTT   120

121  ACTAATTTCCAGTGCCCCAAGGTCTCTGCACTGCCGCCCCTCCTCACAGGAGACGGACAC   180

181  CTCAGCCTAGATCCCTTGGTGCTCTCCACGCTGTTCAGGCTGAATTGAAGATCCCTCTTA   240

241  CCCGCCAGGTGCCAAGAACTATGAACAGGCAGGGCAATAGAAAGACAACTAAAGAAGGAT   300
1                        M  N  R  Q  G  N  R  K  T  T  K  E  G  S    14

301  CCAACGATTTGAAATTCCAGAACTTCAGTCTGCCAAAAAACAGGTCATGGCCTCGCATCA   360
15     N  D  L  K  F  Q  N  F  S  L  P  K  N  R  S  W  P  R  I  N    34

361  ATAGTGCCACAGGCCAGTACCAGAGGATGAACAAGCCTCTTCTAGACTGGGAAAGAAACT   420
35     S  A  T  G  Q  Y  Q  R  M  N  K  P  L  L  D  W  E  R  N  F    54

421  TTGCTGCAGTCCTGGATGGAGCAAAAGGCCACAGTGATGATGACTATGATGACCCTGAGC   480
55     A  A  V  L  D  G  A  K  G  H  S  D  D  D  Y  D  D  P  E  L    74

481  TTCGGATGGAAGAGACATGGCAGTCGATTAAAATTTTACCAGCCCGGCCTATAAAGGAAT   540
75     R  M  E  E  T  W  Q  S  I  K  I  L  P  A  R  P  I  K  E  S    94

541  CTGAATATGCAGATACACACTATTTCAAGGTTGCAATGGACACTCCCCTTCCGTTAGACA   600
95     E  Y  A  D  T  H  Y  F  K  V  A  M  D  T  P  L  P  L  D  T   114

601  CCAGGACCTCTATCTCCATTGGACAGCCGACCTGGAACACACAGACGAGGTTGGAAAGAG   660
115    R  T  S  I  S  I  G  Q  P  T  W  N  T  Q  T  R  L  E  R  V   134

661  TGGACAAACCCATTTCCAAGGACGTCAGAAGCCAAAACATTAAAGGAGATGCATCCGTAA   720
135    D  K  P  I  S  K  D  V  R  S  Q  N  I  K  G  D  A  S  V  R   154

721  GAAAGAACAAGATTCCTTTACCACCTCCTCGGCCTCTCATAACACTTCCGAAGAAGTACC   780
155    K  N  K  I  P  L  P  P  P  R  P  L  I  T  L  P  K  K  Y  Q   174

781  AACCCTTGCCCCCTGAGCCGGAGAGCAGCAGGCCACCTTTATCTCAGAGACACACCTTTC   840
175    P  L  P  P  E  P  E  S  S  R  P  P  L  S  Q  R  H  T  F  P   194

841  CAGAAGTCCAGAGAATGCCCAGTCAGATAAGCTTAAGGGACTTAAGTGAGGTCCTTGAAG   900
195    E  V  Q  R  M  P  S  Q  I  S  L  R  D  L  S  E  V  L  E  A   214

901  CAGAAAAAGTTCCTCATAACCAGAGGAAGCCTGAATCAACTCATCTGTTAGAAAACCAAA   960
215    E  K  V  P  H  N  Q  R  K  P  E  S  T  H  L  L  E  N  Q  N   234

961  ATACTCAAGAGATTCCACTTGCCATTAGCAGTTCTTCATTCACGACAAGCAACCACAGTG  1020
235    T  Q  E  I  P  L  A  I  S  S  S  S  F  T  T  S  N  H  S  V   254

1021 TGCAAAACAGAGATCATAGAGGAGGCATGCAGCCCTGTTCTCCTCAGAGATGCCAGCCTC  1080
255    Q  N  R  D  H  R  G  G  M  Q  P  C  S  P  Q  R  C  Q  P  P   274

1081 CAGCCAGCTGCAGCCCTCACGAAAATATACTGCCCTATAAATACACAAGCTGGAGACCAC  1140
275    A  S  C  S  P  H  E  N  I  L  P  Y  K  Y  T  S  W  R  P  P   294
```

FIG. 6B

```
1141 CTTTCCCCAAAAGGTCTGATAGAAAGGATGTCCAGCACAATGAATGGTACATTGGAGAAT 1200
 295   F  P  K  R  S  D  R  K  D  V  Q  H  N  E  W  Y  I  G  E  Y  314

1201 ACAGCCGCCAGGCAGTGGAAGAGGCATTCATGAAGGAGAACAAGGATGGTAGTTTCTTGG 1260
 315   S  R  Q  A  V  E  E  A  F  M  K  E  N  K  D  G  S  F  L  V  334

1261 TCCGAGATTGTTCCACAAAATCCAAGGAAGAGCCCTATGTTTTGGCTGTGTTTTATGAGA 1320
 335   R  D  C  S  T  K  S  K  E  E  P  Y  V  L  A  V  F  Y  E  N  354

1321 ACAAAGTCTACAATGTAAAAATCCGCTTCCTGGAGAGGAATCAGCAGTTTGCCCTGGGGA 1380
 355   K  V  Y  N  V  K  I  R  F  L  E  R  N  Q  Q  F  A  L  G  T  374

1381 CAGGACTCAGAGGAGATGAGAAGTTTGATTCAGTAGAAGACATCATCGAACACTACAAGA 1440
 375   G  L  R  G  D  E  K  F  D  S  V  E  D  I  I  E  H  Y  K  N  394

1441 ATTTTCCCATTATACTAATTGATGGGAAAGATAAAACTGGGGTCCACAGGAAACAGTGTC 1500
 395   F  P  I  I  L  I  D  G  K  D  K  T  G  V  H  R  K  Q  C  H  414

1501 ACCTCACTCAGCCACTCCCTCTCACCAGACACCTCTTGCCTCTGTAGCCTGGTCTTTGTG 1560
 415   L  T  Q  P  L  P  L  T  R  H  L  L  P  L                  429

1561 TTATCTTTGGTTTACTGGATTCAGCGCTTCCATTGTTTTCATTGATTTCAAAAGTTTATT 1620

1621 TTCTGTGCCTTCAAGGGACAACTTTTTTAACTTTGGAGAAAAGAAAAACACTCTATAACA 1680

1681 GAGAGTGGAAAATCACTCACGGTTTTGAAAGTTCAAACCACAGAGAAAATATTTATAACA 1740

1741 TGCAAAAAATAAAAACATTCTAGTAACTGGCCACTGGAAAATAAATAAAAATAAAAACTA 1800

1801 GGGTTTTAAAAGTATCTTCTAAAAAACAACAACAAAAAATACTATAAACATAGCCATTAT 1860

1861 GCTCATGATACAGGCGAGCAGCAAAGGGCACCAGAAGCTGTTGCTTAAATGTTTGCAGTC 1920

1921 AGTGCAAGACAAGTCTATGGGAAATTCCCAAATCTGTGCTCTTTACAGGACACTGCGCTG 1980

1981 CCTTTATGTCAGTTGTTGGGCCTTACATATATACAATGTGTGGATGATTTCTTACACTAA 2040

2041 AGATGCTGGGCTGGGTGCGGTGCCTCATGCCTGTAATCCCAGCACTTTGGGAGGCTGAGG 2100

2101 TGGACAGATCACGAGGTCAGGAGATCAAGACCATCCTGGCTAACATGGTGAAACCCCATG 2160

2161 TCTACTAAAAAATACAAAAAATCAGCTGGGCGTGGTGGTGGGTGCCTGTAGTCCCAGCTAC 2220

2221 TCGGGAGGCTGAGGCAGGAGAATGGTGTGAACCCGGGAGGCGGAGCTTGCAGTGAGCCGA 2280

2281 AATCGCGCCACTGCACTCCAATCCAGCCTGGGGACAGAGAGACTCCGTCTCAAAA 2335
```

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FIG. 7A

```
   1 GGCTGCTGTTAACAACTTCATGTCCCCGTGGGTAGCAGGCAGGTGCTTCTGTCTGATCTG   60
  61 GCTCTCCTTGACCACTGTACTCATCAAATAGACCAAGATCCCCAGAGTCCAAGATCCTTA  120
 121 CAAGGGGGCCAGAAAGGGATGAGCTTTCTGAAGAAGCACTGATGTAAAATACCAGGAATT  180
 181 TTGACATCGAAGAAGATTTTTGTGATGGCAGCTGGGATTTGGCCATAATCTAGAAGACAC  240
 241 ATGGTGAATACAGTTGCAAGTCATTTAGTCATATTTCTTGCTAAATTGCTGTGTCTTCAA  300
 301 TGGGGCAATAGAAAGACAACTAAAGAAGGATCCAACGATTTGAAATTCCAGAACTTCAGT  360
 361 CTGCCAAAAAACAGGTCATGGCCTCGCATCAATAGTGCCACAGGCCAGTACCAGAGGATG  420
 421 AACAAGCCTCTTCTAGACTGGATTTGGCAGCTTGACCATTTATTATCGCACAGTGGATGC  480
 481 AATCAGAAGTCTGGGCACAGCATGGCTCAACTAGTTCCCCTGTTCTGGGTCTCACAAGAC  540
 541 TGAAAGCAACATGCTGGCAGGGCTGCATTCTCCTCCAGGGGCTCTGAAGAGGAACTTGCT  600
 601 TCCAGATTCTTTCAGGAAAGAAACTTTGCTGCAGTCCTGGATGGAGCAAAAGGCCACAGT  660
 661 GATGATGACTATGATGACCCTGAGCTTCGGATGGAAGAGACATGGCAGTCCATTAAAATT  720
 721 TTACCAGCCCGGCCTATAAAGGAATCTGAATATGCAGATACACACTATTTCAAGGTTGCA  780
 781 ATGGACACTCCCCTTCCGTTAGACACCAGGACCTCTATCTCCATTGGACAGCCGACCTGG  840
 841 AACACACAGACGAGGTTGGAAAGAGTGGACAAACCCATTTCCAAGGACGTCAGAAGCCAA  900
 901 AACATTAAAGGAGATGCATCCGTAAGAAAGAACAAGATTCCTTTACCACCTCCTCGGCCT  960
 961 CTCATAACACTTCCGAAGAAGTACCAACCCTTGCCCCCTGAGCCGGAGAGCAGCAGGCCA 1020
1021 CCTTTATCTCAGAGACACACCTTTCCAGAAGTCCAGAGAATGCCCAGTCAGATAAGCTTA 1080
1081 AGGGACTTAAGTGAGGTCCTTGAAGCAGAAAAAGTTCCTCATAACCAGAGGAAGCCTGAA 1140
1141 TCAACTCATCTGTTAGAAAACCAAAATACTCAAGAGATTCCACTTGCCATTAGCAGTTCT 1200
1201 TCATTCACGACAAGCAACCACAGTGTGCAAAACAGAGATCATAGAGGAGGCATGCAGCCC 1260
1261 TGTTCTCCTCAGAGATGCCAGCCTCCAGCCAGCTGCAGCCCTCACGAAAATATACTGCCC 1320
1321 TATAAATACACAAGCTGGAGACCACCTTTCCCCAAAAGGTCTGATAGAAAGGATGTCCAG 1380
1381 CACAATGAATGGTACATTGGAGAATACAGCCGCCAGGCAGTGGAAGAGGCATTCATGAAG 1440
```

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FIG. 7B

1441 GAGAACAAGGATGGTAGTTTCTTGGTCCGAGATTGTTCCACAAAATCCAAGGAAGAGCCC 1500

1501 TATGTTTTGGCTGTGTTTTATGAGAACAAAGTCTACAATGTAAAAATCCGCTTCCTGGAG 1560

1561 AGGAATCAGCAGTTTGCCCTGGGGACAGGACTCAGAGGAGATGAGAAGTTTGATTCAGTA 1620

1621 GAAGACATCATCGAACACTACAAGAATTTTCCCATTATACTAATTGATGGGAAAGATAAA 1680

1681 ACTGGGGTCCACAGGAAACAGTGTCACCTCACTCAGCCACTCCCTCTCACCAGACACCTC 1740

1741 TTGCCTCTGTAGCCTGGTCTTTGTGTTATCTTTGGTTTACTGGATTCAGCGCTTCCATTG 1800

1801 TTTTCATTGATTTCAAAAGTTTATTTTCTGTGCCTTCAAGGGACAACTTTTTTAACTTTG 1860

1861 GAGAAAAGAAAAACACTCTATAACAGAGAGTGGAAAATCACTCACGGTTTTGAAAGTTCA 1920

1921 AACCACAGAGAAAATATTTATAACATGCAAAAAATAAAAACATTCTAGTAACTGGCCACT 1980

1981 GGAAAATAAATAAAAATAAAAACTAGGGTTTTAAAAGTATCTTCTAAAAAACAACAACAA 2040

2041 AAAATACTATAAACATAGCCATTATGCTCATGATACAGGCGAGCAGCAAAGGGCACCAGA 2100

2101 AGCTGTTGCTTAAATGTTTGCAGTCAGTGCAAGACAAGTCTATGGGAAATTCCCAAATCT 2160

2161 GTGCTCTTTACAGGACACTGCGCTGCCTTTATGTCAGTTGTTGGGCCTTACATATATACA 2220

2221 ATGTGTGGATGATTTCTTACACTAAAGATGCTGGGCTGGGTGCGGTGCCTCATGCCTGTA 2280

2281 ATCCCAGCACTTTGGGAGGCTGAGGTGGACAGATCACGAGGTCAGGAGATCAAGACCATC 2340

2341 CTGGCTAACATGGTGAAACCCCATGTCTACTAAAAATACAAAAAATCAGCTGGGCGTGGT 2400

2401 GGTGGGTGCCTGTAGTCCCAGCTACTCGGGAGGCTGAGGCAGGAGAATGGTGTGAACCCG 2460

2461 GGAGGCGGAGCTTGCAGTGAGCCGAAATCGCGCCACTGCACTCCAATCCAGCCTGGGGAC 2520

2521 AGAGAGACTCCGTCTCAAAA 2540

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FIG. 8

1										M	E	E	T	W	Q	S	I	K	I	10
11	L	P	A	R	P	I	K	E	S	E	Y	A	D	T	H	Y	F	K	V	A	30
31	M	D	T	P	L	P	L	D	T	R	T	S	I	S	I	G	Q	P	T	W	50
51	N	T	Q	T	R	L	E	R	V	D	K	P	I	S	K	D	V	R	S	Q	70
71	N	I	K	G	D	A	S	V	R	K	N	K	I	P	L	P	P	P	R	P	90
91	L	I	T	L	P	K	K	Y	Q	P	L	P	P	E	P	E	S	S	R	P	110
111	P	L	S	Q	R	H	T	F	P	E	V	Q	R	M	P	S	Q	I	S	L	130
131	R	D	L	S	E	V	L	E	A	E	K	V	P	H	N	Q	R	K	P	E	150
151	S	T	H	L	L	E	N	Q	N	T	Q	E	I	P	L	A	I	S	S	S	170
171	S	F	T	T	S	N	H	S	V	Q	N	R	D	H	R	G	G	M	Q	P	190
191	C	S	P	Q	R	C	Q	P	P	A	S	C	S	P	H	E	N	I	L	P	210
211	Y	K	Y	T	S	W	R	P	P	F	P	K	R	S	D	R	K	D	V	Q	230
231	H	N	E	W	Y	I	G	E	Y	S	R	Q	A	V	E	E	A	F	M	K	250
251	E	N	K	D	G	S	F	L	V	R	D	C	S	T	K	S	K	E	E	P	270
271	Y	V	L	A	V	F	Y	E	N	K	V	Y	N	V	K	I	R	F	L	E	290
291	R	N	Q	Q	F	A	L	G	T	G	L	R	G	D	E	K	F	D	S	V	310
311	E	D	I	I	E	H	Y	K	N	F	P	I	I	L	I	D	G	K	D	K	330
331	T	G	V	H	R	K	Q	C	H	L	T	Q	P	L	P	L	T	R	H	L	350
351	L	P	L																		353

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FIG. 9A

```
   1  GGCTGCTGTTAACAACTTCATGTCCCCGTGGGTAGCAGGCAGGTGCTTCTGTCTGATCTG   60

  61  GCTCTCCTTGACCACTGTACTCATCAAATAGACCAAGATCCCCAGAGTCCAACATCCTTA  120

 121  CAAGGGGGCCAGAAAGGGATGAGCTTTCTGAAGAAGCACTGATGTAAAATACCAGGAATT  180

 181  TTGACATCGAAGAAGATTTTTGTGATGGCAGCTGGGATTTGGCCATAATCTACAAGACAC  240

 241  ATGGTGAATACAGTTGCAAGTCATTTAGTCATATTTCTTGCTAAATTGCTGTCTCTTCAA  300

 301  TGGGGCAATAGAAAGACAACTAAAGAAGGATCCAACGATTTGAAATTCCAGAACTTCAGT  360

 361  CTGCCAAAAAACAGGTCATGGCCTCGCATCAATAGTGCCACAGGCCAGTACCAGAGGATG  420

 421  AACAAGCCTCTTCTAGACTGGATTTGGCAGCTTGACCATTTATTATCGCACAGTGGATGC  480

 481  AATCAGAAGTCTGGGCACAGCATGGCTCAACTAGTTCCCCTGTTCTGGGTCTCACAAGAC  540

 541  TGAAAGCAACATGCTGGCAGGGCTGCATTCTCCTCCAGGGGCTCTGAAGAGGAACTTGCT  600

 601  TCCAGATTCTTTCAGGAAAGAAACTTTGCTGCAGTCCTGGATGGAGCAAAAGGCCACAGT  660

 661  GATGATGACTATGATGACCCTGAGCTTCGGATGGAAGAGACATGGCAGTCGATTAAAATT  720
   1                                   M  E  E  T  W  Q  S  I  K  I   10

 721  TTACCAGCCCGGCCTATAAAGGAATCTGAATATGCAGATACACACTATTTCAAGGTTGCA  780
  11  L  P  A  R  P  I  K  E  S  E  Y  A  D  T  H  Y  F  K  V  A   30

 781  ATGGACACTCCCCTTCCGTTAGACACCAGGACCTCTATCTCCATTGGACAGCCGACCTGG  840
  31  M  D  T  P  L  P  L  D  T  R  T  S  I  S  I  G  Q  P  T  W   50

 841  AACACACAGACGAGGTTGGAAAGAGTGGACAAACCCATTTCCAAGGACGTCAGAAGCCAA  900
  51  N  T  Q  T  R  L  E  R  V  D  K  P  I  S  K  D  V  R  S  Q   70

 901  AACATTAAAGGAGATGCATCCGTAAGAAAGAACAAGATTCCTTTACCACCTCCTCGGCCT  960
  71  N  I  K  G  D  A  S  V  R  K  N  K  I  P  L  P  P  P  R  P   90

 961  CTCATAACACTTCCGAAGAAGTACCAACCCTTGCCCCCTGAGCCGGAGAGCAGCAGGCCA 1020
  91  L  I  T  L  P  K  K  Y  Q  P  L  P  P  E  P  E  S  S  R  P  110

1021  CCTTTATCTCAGAGACACACCTTTCCAGAAGTCCAGAGAATGCCCAGTCAGATAAGCTTA 1080
 111  P  L  S  Q  R  H  T  F  P  E  V  Q  R  M  P  S  Q  I  S  L  130

1081  AGGGACTTAAGTGAGGTCCTTGAAGCAGAAAAAGTTCCTCATAACCAGAGGAAGCCTGAA 1140
 131  R  D  L  S  E  V  L  E  A  E  K  V  P  H  N  Q  R  K  P  E  150

1141  TCAACTCATCTGTTAGAAAACCAAAATACTCAAGAGATTCCACTTGCCATTAGCAGTTCT 1200
 151  S  T  H  L  L  E  N  Q  N  T  Q  E  I  P  L  A  I  S  S  S  170

1201  TCATTCACGACAAGCAACCACAGTGTGCAAAACAGAGATCATAGAGGAGGCATGCAGCCC 1260
 171  S  F  T  T  S  N  H  S  V  Q  N  R  D  H  R  G  G  M  Q  P  190

1261  TGTTCTCCTCAGAGATGCCAGCCTCCAGCCAGCTGCAGCCCTCACGAAAATATACTGCCC 1320
```

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FIG. 9B

```
191  C  S  P  Q  R  C  Q  P  P  A  S  C  S  P  H  E  N  I  L  P      210

1321 TATAAATACACAAGCTGGAGACCACCTTTCCCCAAAAGGTCTGATAGAAAGGATGTCCAG  1380
211  Y  K  Y  T  S  W  R  P  P  F  P  K  R  S  D  R  K  D  V  Q      230

1381 CACAATGAATGGTACATTGGAGAATACAGCCGCCAGGCAGTGGAAGAGGCATTCATGAAG  1440
231  H  N  E  W  Y  I  G  E  Y  S  R  Q  A  V  E  E  A  F  M  K      250

1441 GAGAACAAGGATGGTAGTTTCTTGGTCCGAGATTGTTCCACAAAATCCAAGGAAGAGCCC  1500
251  E  N  K  D  G  S  F  L  V  R  D  C  S  T  K  S  K  E  E  P      270

1501 TATGTTTTGGCTGTGTTTTATGAGAACAAAGTCTACAATGTAAAAATCCGCTTCCTGGAG  1560
271  Y  V  L  A  V  F  Y  E  N  K  V  Y  N  V  K  I  R  F  L  E      290

1561 AGGAATCAGCAGTTTGCCCTGGGGACAGGACTCAGAGGAGATGAGAAGTTTGATTCAGTA  1620
291  R  N  Q  Q  F  A  L  G  T  G  L  R  G  D  E  K  F  D  S  V      310

1621 GAAGACATCATCGAACACTACAAGAATTTTCCCATTATACTAATTGATGGGAAAGATAAA  1680
311  E  D  I  I  E  H  Y  K  N  F  P  I  I  L  I  D  G  K  D  K      330

1681 ACTGGGGTCCACAGGAAACAGTGTCACCTCACTCAGCCACTCCCTCTCACCAGACACCTC  1740
331  T  G  V  H  R  K  Q  C  H  L  T  Q  P  L  P  L  T  R  H  L      350

1741 TTGCCTCTGTAGCCTGGTCTTTGTGTTATCTTTGGTTTACTGGATTCAGCGCTTCCATTG  1800
351  L  P  L  *                                                      354

1801 TTTTCATTGATTTCAAAAGTTTATTTTCTGTGCCTTCAAGGGACAACTTTTTTAACTTTG  1860

1861 GAGAAAAGAAAAACACTCTATAACAGAGAGTGGAAAATCACTCACGGTTTTGAAAGTTCA  1920

1921 AACCACAGAGAAAATATTTATAACATGCAAAAAATAAAAACATTCTAGTAACTGGCCACT  1980

1981 GGAAAATAAATAAAAATAAAAACTAGGGTTTTAAAAGTATCTTCTAAAAAACAACAACAA  2040

2041 AAAATACTATAAACATAGCCATTATGCTCATGATACAGGCGAGCAGCAAAGGGCACCAGA  2100

2101 AGCTGTTGCTTAAATGTTTGCAGTCAGTGCAAGACAAGTCTATGGGAAATTCCCAAATCT  2160

2161 GTGCTCTTTACAGGACACTGCGCTGCCTTTATGTCAGTTGTTGGGCCTTACATATATACA  2220

2221 ATGTGTGGATGATTTCTTACACTAAAGATGCTGGGCTGGGTGCGGTGCCTCATGCCTGTA  2280

2281 ATCCCAGCACTTTGGGAGGCTGAGGTGGACAGATCACGAGGTCAGGAGATCAAGACCATC  2340

2341 CTGGCTAACATGGTGAAACCCCATGTCTACTAAAAATACAAAAAATCAGCTGGGCGTGGT  2400

2401 GGTGGGTGCCTGTAGTCCCAGCTACTCGGGAGGCTGAGGCAGGAGAATGGTGTGAACCCG  2460

2461 GGAGGCGGAGCTTGCAGTGAGCCGAAATCGCGCCACTGCACTCCAATCCAGCCTGGGGAC  2520

2521 AGAGAGACTCCGTCTCAAAA                                          2540
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T08260 "9569660

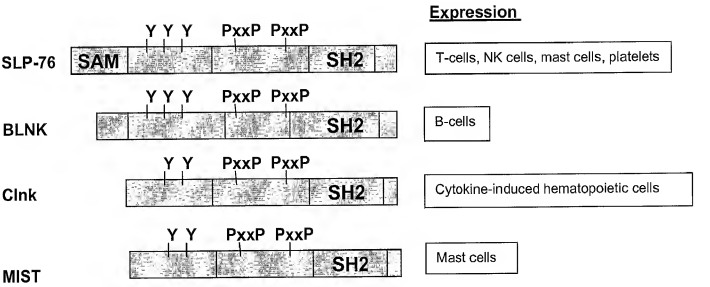


FIG. 10

TOB260" S5699560

FIG. 11

Recombinant MIST proteins

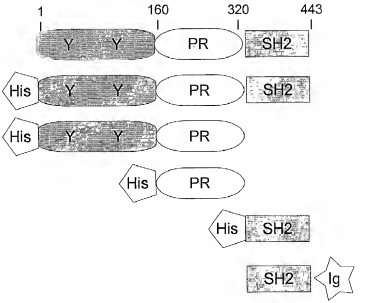
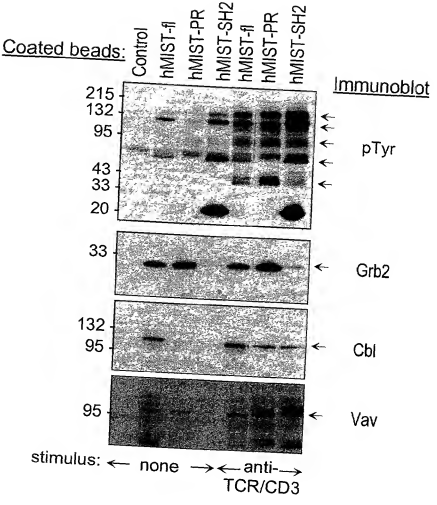


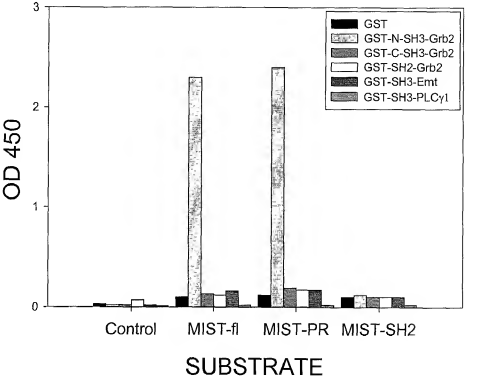
FIG. 12


Coated beads:
Control
hMIST-fl
hMIST-PR
hMIST-SH2
hMIST-fl
hMIST-PR
hMIST-SH2
Immunoblot
215
132
95
43
33
20
pTyr
33
Grb2
132
95
Cbl
95
Vav
stimulus:
none
anti-TCR/CD3

TD9260 "S5699660

FIG. 13

Interaction between hMIST and Grb2-SH3 domain



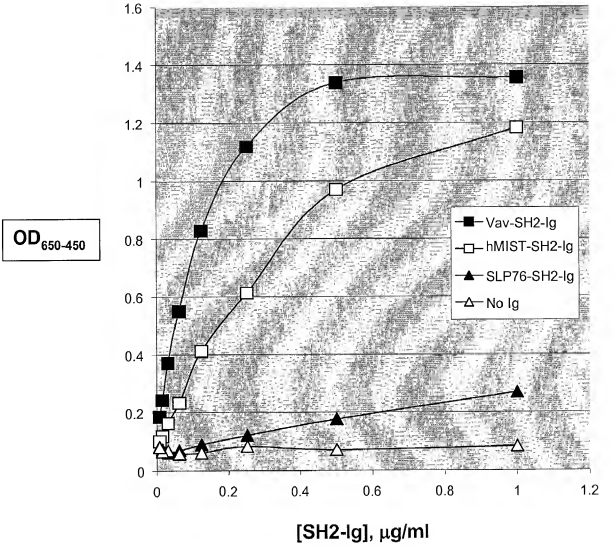

OD650-450
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0
0.2
0.4
0.6
0.8
1
1.2
Vav-SH2-Ig
hMIST-SH2-Ig
SLP76-SH2-Ig
No Ig
[SH2-Ig], µg/ml

FIG. 14

T08260"556960

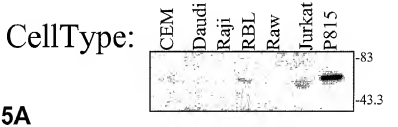


FIG. 15A

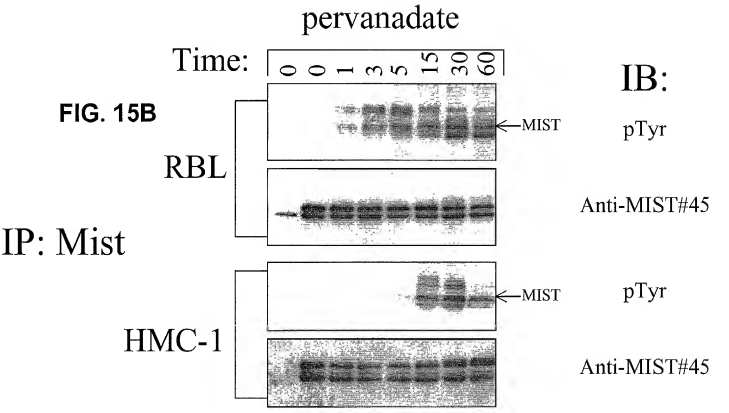


FIG. 15B